

Abstract Submitted
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**Universality in rank distributions due to multiplicative processes
: from power laws to stretched exponentials** GERARDO NAUMIS, Depto.
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Although power laws have been used to fit rank distributions in many different
contexts, they usually fail at the tails. Stretched exponentials and log-normal distri-
butions have been used to solve the problem, but unfortunately they are not able to
fit at the same time both ending tails. Here we show that many different data in rank
laws, like in granular materials, codons, author impact in scientific journal, etc. are
very well fitted by a beta-like function (a,b distribution). Since this distribution is
indeed ubiquitous, it is reasonable to associate it to the product of correlated proba-
bility distributions. In particular, we have found that the macrostates of the product
of discrete probability distributions imply stretched exponential-like frequency-rank
functions, which qualitatively and quantitatively can be fitted with the a,b distribu-
tion in the limit of many random variables [1]. We prove this by transforming the
problem into an algebraic one: finding the rank of successive products of a given set
of numbers. [1] New J. Phys. 9 (2007) 286. (2007).

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